International Journal of Electrical, Computing Engineering and Communication (IJECC)

Vol. 1, Issue. 3, June – 2015 *ISSN (Online): 2394-8310*

An Efficient Way of Detecting Numbers in Car Number Plate Using Neural Network

[1]C.Subha, [2]S.Sudha

M.E, Computer science, Sree Sowdambika College of Engineering, Aruppukottai, INDIA

Assistant Professor, Department of Computer Science and engineering, Sree Sowdambika College of Engineering, Aruppukottai, INDIA

***Abstract* – Nowadays Car Number Plate Detection is very important application in society. In this paper presents Neural Network to detect number plate. This detection technique used to identify correct and incorrect number plate characters. For this method Indian number plates are taken for various processes. First image preprocessing then segmentation process and recognition process are taken place. Lot of images are taken for this process these are stored in the database. This project is implemented using MATLAB.**

Index Terms* – *Car Number Plate Detection, Feature Extraction, Neural Network, Recognition, Segmentation.

I.INTRODUCTION

In this proposed system explains automatic number plate detection method. This system uses the one of the algorithm like neural network. This algorithm is efficient compare with others. So it produces more accuracy of the output. This project contains mainly three steps that are character segmentation, feature extraction and character recognition process. Before we are going to the segmentation process first the color image is converted into the gray image and filter the noises then morphological processes are performed in the image pre-processing step. Then move on to the segmentation process. In this step CCA and blob detections are performed to segment the characters. Then feature extraction is contains edge detection step and features are calculated based on the edges. Then finally process the recognition step. In this step neural network is performed. ASCII values and feature vector table both are trained and compared. Then finally produce the output through the notepad.

II.PROPOSED SYSTEM

The proposed system uses three phases:

1) Character segmentation
2) Feature extraction
3) Character Recognition

III.IMAGE PRE-PROCESSING

In this step, an input color or noisy image is used to an order of processes for perform the segmentation process. It has many steps, as described in Fig. 1.

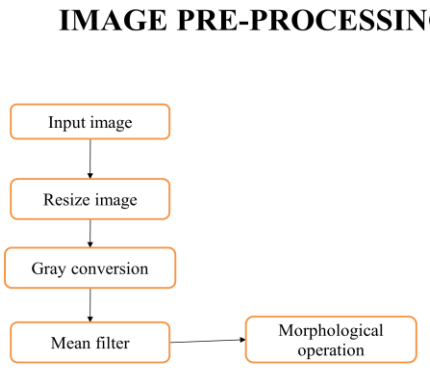

Fig 1. Block diagram of image pre-processing

A. Resize an image

First an input color image is get from the user next that image is resize for our convenient.

B. Gray conversion

After resized image is changed into the gray image.

C. Mean filter

Mean filtering is a nonlinear method used to remove unwanted noise. It is usually used as it is very efficient at removing noise while preserving edges.

D. Morphological Operations

Morphological operations such as noise removal, filling, erosion and dilation these are performed to

produce clear result.

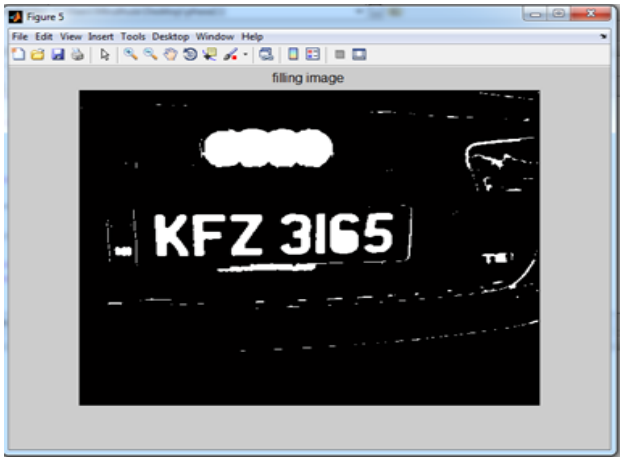

Fig 2. After morphological operation

IV.CHARACTER SEGMENTATION

In this phase there are two steps are involved.

1) Connected component analysis
2) Blob detection

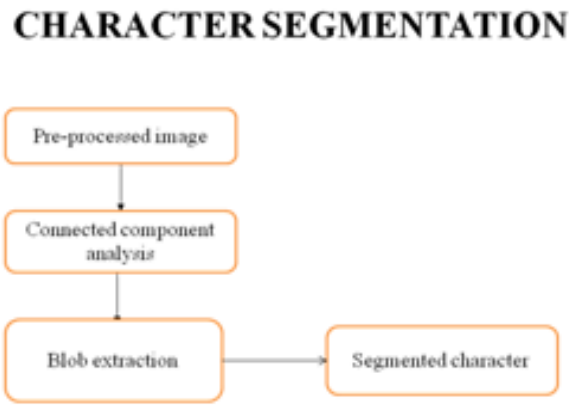

Fig 3. Flow diagram of character segmentation

A. CCA Process

CCA means Connected Component Analysis used to view the connected regions of the car number plate image. What are the objects are kept in that image those are bounded by the green rectangle box.

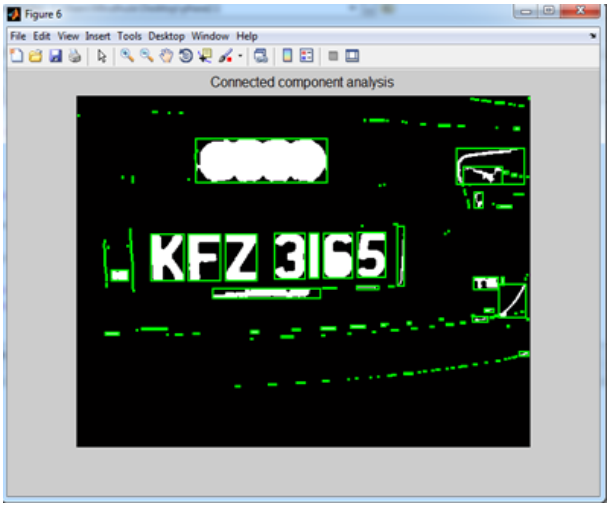

Fig 4. Result of connected component analysis

B. Blob detection

After the CCA process particular number plate character only extracted by this blob detection process.

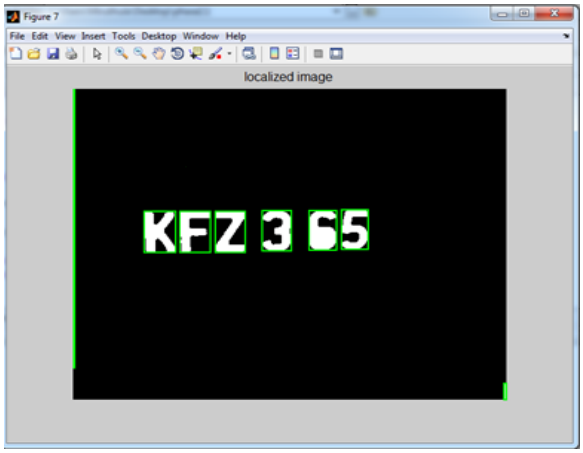

Fig 5. Blob extraction

V.FEATURE EXTRACTION

The feature extraction is one of the processes. This is used to extract some type of features based on the edges of every character. These feature values are used for the neural network to recognition process. This feature extraction stage contains below steps.

1) Edge detection
2) Calculation of edge density value

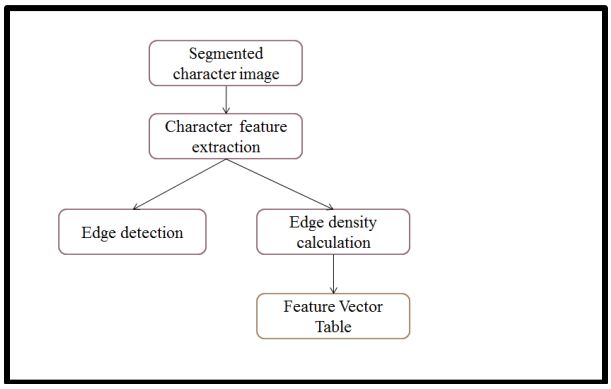

Fig 6. Block diagram of feature extraction

A. Edge Detection

Edge detection is used to detect the edges of each and every character. This process is very important to calculate the density of edges. Edge detection uses the canny method for this detection. This is the edge detection process of this proposed system.

B. Calculation of edge density value

This is the important step because this is the heart of my project. So more concentrate on this step. After edge detection each and every characters are individually stored in one of the folder. That are contains only the edges of each character. For this calculation we consider each character as one by one. First take the one of the character that is divided into 4 parts. That each part Contains the equal size. Each block contains the magnitude value, and two dimensions. So based on these attributes we can calculate this density value. These are stored in the one table. That is called as feature vector table this is shown in given table.

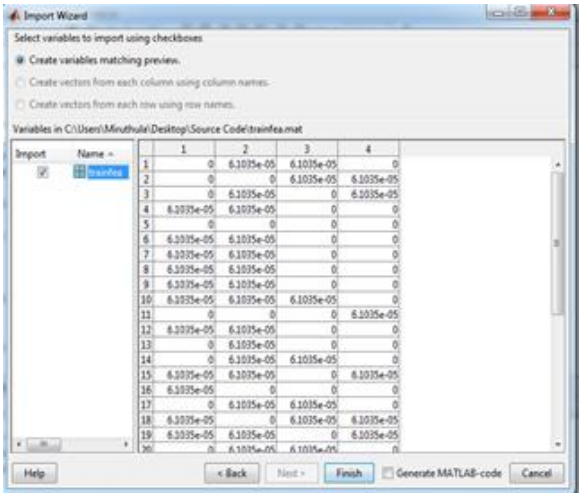

Table 1: Feature Vector Table

VI.CHARACTER RECOGNITION

Character recognition process is used to recognize every character. That is shows in the below diagram. In this recognition process neural network is used to explore an output. The feature vector table and ASCII values are given to the neural network. Each and every character contains ASCII values these also stored in another folder these two values are compared trained in the neural network and then tested that values with the car images. Then finally produce the appropriate output.

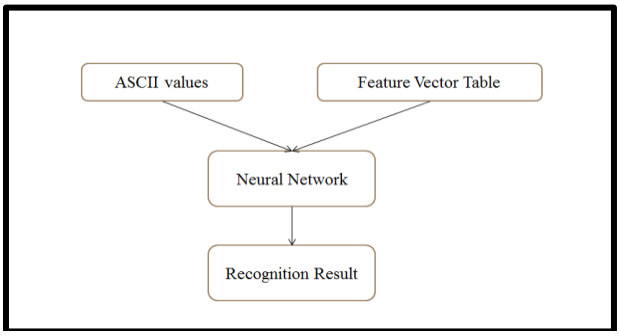

Fig 7. Flow diagram of character recognition process

VII.CONCLUSION

This proposed system produced good results for car number plate images. This system removes any type of noises and also produces the clear output. Time also minimized compare with other methods. Lot of images is stored in the dataset all those

images are produce the correct result of my project. For this high accuracy I used artificial neural network. One of my outputs is shown in below diagram.

Fig 8. Expected output result of testing image

REFERENCES

[1] A. Ahmadyfard and V. Abolghasemi, "Detecting license plate using texture and color information," in *Proc. Int. Symp. Telecommun.*, 2008, pp. 804–808.

[2] G. Li, R. Yuan, Z. Yang, and X. Huang, "A yellow license plate location method based on RGB model of color image and texture of plate," in *Proc. 2nd Workshop Digit. Media Its Appl. Museum Heritages*, 2007, pp. 42–46.

[3] X. Shi, W. Zhao, Y. Shen, and O. Gervasi, "Automatic license plate recognition system based on color image processing," in *Lecture Notes on Computer Science*, Berlin, Germany: Springer-Verlag, 2005, vol. 3483, pp. 1159–1168.

[4] M. Deriche, "GCC license plates detection and recognition using morphological filtering and neural networks," *Int J. Comp. Sci. Info Security*, vol. 8, no. 8, pp. 263–269, Dec. 2010.

[5] O. Villegas, D. Balderrama, H. Domínguez, and V. Sánchez, "License plate recognition using a novel fuzzy multilayer neural network," *Int. J. Comput.*, vol. 3, no. 1, pp. 31–40, 2009.

[6] S. H. M. Kasaei, S. M. M. Kasaei, and S. A. Monadjemi, "A novel morphological method for detection and recognition of vehicle license plate," *Amer. J. Appl. Sci.*, vol. 6, no. 12, pp. 2066–2070, 2009.

[7] A. Theja, S. Jain, A. Aggarwal, and V. Kandanvli, "License plate extraction using adaptive threshold and line grouping," in *Proc. ICSPS*, Jul. 2010, vol. 1, pp. 211–214.

[8] P. Tarabek, "Fast license plate detection based on edge density and integral edge image," in *Proc. Int. Conf. Appl. Mach. Intell. Inform, 2012*, pp. 37–40.

[9] V. Abolghasemi and A. Ahmadyfard, "A fast algorithm for license plate detection," in *Proc. Int. Conf. Visual Inform. Syst.*, 2007, vol. 4781, pp. 468–477.

[10] S. Roomi, M. Anitha, and R. Bhargavi, "Accurate license plate localization," in *Proc. Int. Conf. Comput. Commun. Electr. Technol.*, 2011, pp. 92–99.

[11] S. K. Kim, D. W. Kim, and H. J. Kim, "A recognition of vehicle license plate using a genetic algorithm based segmentation," in *Proc. Int. Conf. Image Process.*, 1996, vol. 1, pp. 661–664.

[12] J. Xiong, S. Du, D. Gao, and Q. Shen, "Locating car license plate under various illumination conditions using genetic algorithm," in *Proc. ICSP*,2004, vol. 3, pp. 2502–2505.

[13] Z. Ji-yin, Z. Rui-rui, L. Min, and L. Yinin, "License plate recognition based on genetic algorithm," in *Proc. Int. Conf. Comput. Sci. Software Eng.*, Dec. 2008, vol. 1, pp. 965–968.

[14] Deepti Sagar, Maitreyee Dutta "Block based neural network for automatic number plate recognition" in IJSRP, Vol 4, sep 2014, pp. 1-7.